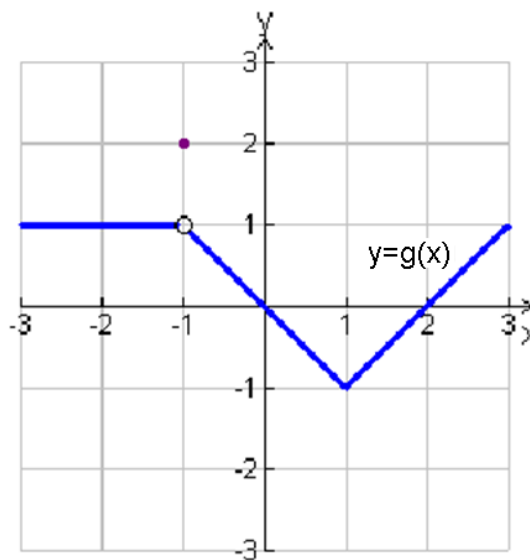
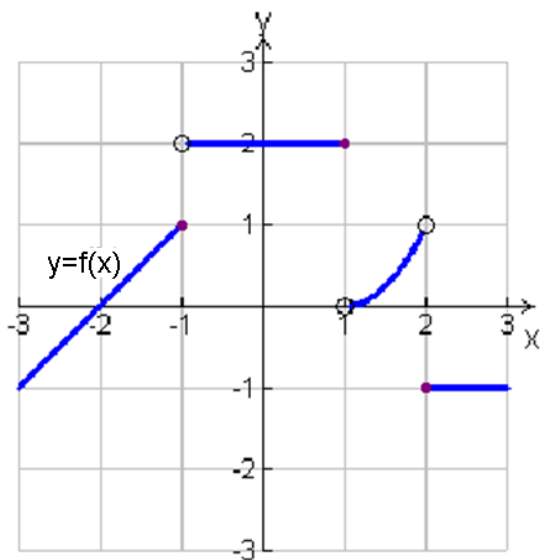


**Study Technique 2:** While working through homework, it is very tempting to use a solution manual. Solution manuals can be very helpful and very effective, but only if used correctly. The correct way to use a solution manual is, if possible, to read the first one or two lines of a solution and then try to continue the problem from there without looking at the manual's solution again. If that is not possible, then read the solution all the way through, but then close the manual and try to reproduce the solution (or at least the main ideas of the solution) without the aid of the manual.

**Part A.** Use the graphs of functions  $f$  and  $g$  to determine whether the following limits exist. If the limit exists, then find the limit. If the limit does not exist, then explain why not.



1)  $\lim_{x \rightarrow 1} f(x)$

2)  $\lim_{x \rightarrow 1^+} f(x)$

3)  $\lim_{x \rightarrow -1} g(x)$

4)  $\lim_{x \rightarrow -1} [f(x) + g(x)]$

5)  $\lim_{x \rightarrow 0} \frac{f(x)}{g(x)}$

6)  $\lim_{x \rightarrow 2} [f(x)g(x)]$

7)  $\lim_{x \rightarrow -2} g(f(x))$

8)  $\lim_{x \rightarrow -1} f(g(x))$

**Part B.** Compute the limits, write in words what techniques you used to solve them.

$$1) \lim_{x \rightarrow 1} \frac{x^3 - x^2 + x - 1}{x^2 - 1}$$

$$2) \lim_{x \rightarrow 3} \frac{\sqrt{x} - \sqrt{3}}{x - 3}$$

$$3) \lim_{x \rightarrow 0} \frac{x^2}{1 - \sqrt{1 - x^2}}$$

$$4) \lim_{x \rightarrow a^+} \frac{|x - a|}{x - a}$$

$$5) \lim_{x \rightarrow 0} \frac{\sin^2 2x}{x^2}$$

$$6) \lim_{x \rightarrow 2} f(x), \lim_{x \rightarrow 2^-} f(x), \lim_{x \rightarrow 2^+} f(x) \text{ where } f(x) = \begin{cases} x^2 & \text{if } x \geq 2 \\ \frac{x^2 - 4}{x - 2} & \text{if } x < 2 \end{cases}$$